









COVER PAGE	SPECIES			
Eriosoma	lanigerum		-	
Kingdom:	Animalia	10020	20	
Phylum:	Arthropoda	1000	april 1	
Class:	Insecta		18 B	
Order:	Hemiptera	1 Miles	1 Jacob	
Suborder:	Sternorrhyncha	k		
Family:	Aphididae		Photo source: Internet	
Subfamily:	Eriosomatinae		Credit: Luisa Alvim	
Genus:	Eriosoma			
Species:	E. lanigerum			
Common name	Woolly apple	aphid, woolly aphid or Ame	rican blight	
Hosts :	Feeds on the l	Aphia Feeds on the Rosaceae family. Malus domestica is the preferred host, Apple/Pear		
	preferred hos			
Native of :	China			
Entry through India	Tamil Nadu in the year 1889			
Predators :	Forficula auricularia L., Chrysoperla carnea (Stephens), Ballia			
Parasitoid :	<i>Aphelinus muls</i> <i>Aphelinus mal</i> 98% of aphid agent for woo	<i>., Coccinenta septempunctata</i> <i>li</i> (Haldemann). After release s and serves a prominent bio ly aphid.	L e, it controls up to blogical control	

Symptoms

the formation of swellings, and plants look unhealthy even<br/>leading to deathChemical controlDip-treatment with fenitrothion or dichlorvos or by soil<br/>application of phorate granules

Nymphs and adults are sap suckers, roots are damaged by

# **ABOUT ENVIS**

Ministry of Environment, forest and Climate Change's (MoEFCC) Environmental Information System (ENVIS) resource partner at Amrita Vishwa Vidyapeetham is established to disseminate scientific, technical, and semi-technical information on various issues related to biological invasion/Invasive Alien Species and conduct related research and extension activities.

#### Some of the objectives of the ENVIS Centre are:

- 1. To promote, implement, and coordinate Green Skill Development Programme (GSDP), an initiative to skill youth in environment, forest, and wildlife sectors and enable them to be self-employed. E.g., lantana craft and furniture making, herbal kitchen gardening of native species.
- 2. To implement and coordinate National Environment Survey (NES) a Grid-based Resource Information and Decision Support System (GRIDSS) for sustainable management of natural resources to fill in data gaps with respect to various environmental parameters such as emission inventory and pollution; forest and wildlife (flora and fauna); wetlands; rivers and other water bodies; public health, etc.
- 3. To implement and coordinate a community driven Environmentally Sustainable Village Programme (CESVP) with the objective of mobilizing communities on environmental issues, creating decentralized models of development to empower local communities and build an awareness driven atmosphere in villages to adopt environmentally sustainable practices at community level.
- 4. To build a repository and dissemination centre in Environmental Science, Information and Management (ESIM).
- 5. To support and promote research, development and innovation in ESIM.
- 6 To promote national cooperation and liaise with agencies concerned for exchange of environment and biological invasion related information.

### Dr. Maya Mahajan



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Lantana Furniture and Crafts Advance course, conducted in Sengeuttaiyur village, Coimbatore, is a crucial component of the ENVIS RP project, Coimbatore, which is part of the GSDP course. NTFPs (Plant Origin): Value addition and marketing of NTFPs (Plant Origin): Lantana Furniture and Crafts Advance course Innovatively, the herb was promoted as a means of income and employment for forestdwelling tribespeople. Lantana, an invasive plant that is threatening indigenous biodiversity, has also been reduced as a result of this unique approach.

The second phase of the training programme was conducted in Dahanu,

Lantana Craft training under Green Skill Development Programme at Dahanu, Maharashtra



Maharashtra, where twenty young tribal people attended the training programme. Out of 20, majorities (13) of the participants were women. Dr. Maya Mahajan, Coordinator, visited the training programme and led a session on the goals of the programme and its long-term viability. She discussed how invasive alien plants, like lantana, have a detrimental influence on biodiversity and the forest ecology and how this training might be utilised as a long-term source of income. The

ENVIS Amrita team has routinely supervised the programme while the Nareshwadi Learning Center staff has supported its execution.

After successful completion of the training programme a valedictory function of GSDP training programme at Dahanu, Maharashtra was organized on 28<sup>th</sup> April, 2022.



# **Invasive plant**

species in India

Laboni Nandi School of Ecology and Environment studies Nalanda University Rajgir,Bihar

#### Introduction

Invasive species are creatures that reason ecological or economical impairment in a pleasant environment where it is not native. This is mostly blowout by human activities often involuntarily. Invasive plant species are also called Exotic species, Foreign species, non-native or Alien species. Invasive species are the potential to cause harm, and are given the label 'Invasive'. Not all non-native species become invasive when they are introduced into new areas, and lack control by natural enemies( predators, parasites, and pathogens that can control the species in its home range) is another way to become invasive species. Invasive species affect the environment viz, leading threats to native wildlife, it also causes the extinction of native plants and animals, reducing biodiversity, and competing with the native organism for limited and altering habitats.

Creatures have been transporting animals and plants from one part of the world to another for thousands of years, sometimes deliberately for social or personal gain and sometimes accidentally. In most cases, such introductions are unsuccessful, but when they do become established as an invasive alien species (defined by IUCN (2000) as "an alien species which becomes established in natural or semi-natural ecosystems or habitat, is an agent of change, and threatens native biological diversity"), the consequences can be catastrophic. Many invasive plants continue to be admired by people who may not be aware of their weedy nature. Others are recognized as weeds but property bearers fail to do their part in preventing their spread. Some species do not even become invasive until they are neglected for a long time. Invasive plants are not all equally invasive. Some only colonize small areas and do not do so aggressively. Others may spread and come to dominate large areas in just a few years. The loss due to invasive species in the United States is estimated to be \$125-150 billion each year and 25% of US agriculture's gross national discovery is lost due to foreign pests and weeds (McNeely et al. 2001). Alien plants can spread rapidly because of our mobile society and the deliberate transference of ornamental and forage plants (Randall and Marinelli, 1997).

#### **Characteristics feature of Invasive Species:**

- Invasive species possess characteristic features like "innovator species" in varied landscapes, tolerant of a wide range of soil and weather conditions, generalist in distribution, produce copious amounts of seed that separate easily, grow aggressive root systems, have short generation time, and high dispersal rates, long flowering and fruiting periods, broad instinctive range, abundant in the instinctive range.
- Introductory data from one interesting study expressions that invasive species are likely to have relatively small amounts of DNA in their cell nuclei.
- Deceptively, the cells in these plants are able to rift and multiply more quickly, and consequently, the entire plant can grow more rapidly than species with higher cellular DNA content. This gives them a leg up in bothered sites.
- According to World Conservation Monitoring Centre (WCMC), 1,604,000 species have been designated at the global level. Thus India accounts for 8% of the global biodiversity existing in only 2.4% land area of the world. According to Nayar (1989), the number of flowering plant species endemic to the present political boundaries of this country is 4900 out of a total of 15000, i.e. 33%. Hajra & Mudgal (1997) report 5400 endemics in 17000 angiospermous species of India, which comes to 31.76 %.
- India is an imperative centre of agri-biodiversity having contributed 167 species to the world agriculture and homeland for 320 species of wild relatives of crops. The present study focuses on 173 species of invasive alien plants in India. These include the most serious invasives, such as Alternanthera philoxeroides, Cassia uniflora, Chromolaena odorata, Eichhornia crassipes, Lantana camara, Parthenium hysterophorus, Prosopis juliflora, and others.

#### Discussion

In India, all-inclusive studies on invasive species and plant invasions are still missing excluding for a few studies (Reddy, 2008; Khanna, 2009; Singh et al., 2010; Chandra Sekar, 2012; Chandra Sekar et al., 2012).

Alien species are non-native or inexplicable organisms that occur outside their natural adapted ranges and dispersal latent. Many alien species support our farming and forestry systems in a big way. However, some alien species become invasive when they are familiarized deliberately or unintentionally outside their ordinary habitats into new areas where they express the capability

to create, invade and outcompete native species. The International Union for Conservation of Nature and Natural Resources (IUCN) defines Alien Invasive Species as an alien species which becomes established in natural or seminatural ecosystems or habitats, an agent of change, and threatens native biological diversity. These invasives are widely distributed in all kinds of ecosystems throughout the world and include all categories of living organisms. The threat to biodiversity due to invasive alien species is measured second only to that. habitat devastation. Invasive species cause loss of biodiversity including species destructions and changes in hydrology and ecosystem function.

Others may spread and come to lead large



areas in just a few years. The loss due to invasive species in the United States is appraised to be \$125-150 billion each year and 25% of US agriculture's gross national discovery is lost due to foreign pests and weeds (McNeely et al. 2001). Alien plants can spread rapidly because of our mobile society and the cautious transference of ornamental and forage plants (Randall and Marinelli, 1997).

Differences between native and exotic plant species in their requirements and modes of resource acquisition and consumption may origin from a change in soil structure, its profile, decomposition, nutrient content of the soil, moisture availability, etc. Invasive species are thus a serious hindrance to conservation and sustainable use of biodiversity, with momentous uninvited

impacts on the goods and services provided by ecosystems. Ecology of invasion entails information on the rate and mechanism of transport and movement of the organism, on characteristics allowing a species to become a successful invader, and also on the properties of the ecosystems that make them susceptible to the invaders (V. Khanna, Zoological Survey of India). Probable traits that favor invasiveness in terrestrial plants include high tolerance against environmental extremes and greater adaptability to a wide range of environmental conditions; high water, light, and nutrient use efficiencies; zero or very short dormancy period, high productivity; and high reproductive potential. Emerging mechanisms of plant invasion such as the enemy release hypothesis and novel weapon hypothesis (allelopathy) were part of the deliberations. Among them here will discuss three plant invasive species in India which is day by day extinct due to a lot of anthropogenic activities.

#### **Black Wattle**

Common Name: Black wattle Scientific Name: <u>Acacia mearnsii</u> (Fabaceae) Alternative common names: Swartwattel (Afrikaans) Nativity: South East Australia Distribution in India: Western Ghats Features: Introduced for afforestation in the Western Ghats. Regenerates rapidly after a fire and forms dense thickets. It is distributed in forests and grazing lands in high-altitude areas.

Description: An evergreen tree growing 5-10m high, black wattle has dark olivegreen finely hairy leaves. Pale

yellow or cream spherical flowers in large fragrant sprays blooming from August to September. Fruits are dark brown, finely-haired pods. Black wattle has invaded grasslands, competing with and reducing indigenous species, and reducing grazing land for wild and domestic animals.

This species comes from south-eastern Australia and Tasmania. This species spread by Seed dispersal. The main

issue is that Why this species become a problem?, Competes with and replaces indigenous grassland and riverine species. Grasslands are invaded by dense thickets of black wattle, which reduced the grazing area for domestic and wild animals. So this species is An evergreen tree growing 5-10m high, black wattle has dark olive-green finely hairy leaves. And this species of bark is like a Rough, greyish bark. And this species of Leaves are Dark olive-green short leaflets (1.5-4.0mm), with fine hairs. The beautiful Flowers of this invasive species like Small pale yellow to cream, globe-shaped flowers in large, fragrant sprays, August to September. The Fruit/seeds of black wattle is Finely haired, dark brown pods.



#### Touch-me-not/ Sleeping grass:

Common Name: Touch-me-not or sleeping grass. Scientific Name: <u>Mimosa pudica</u> Nativity: Brazil Distribution in India: Throughout Features: Aggressive colonizer. Common weed of cultivated fields, scrubs lands and degraded forests. **Description:** The stem is erect in young plants but becomes creeping or trailing with age. It can hang very low and become floppy. The stem is slender, branching, and sparsely to densely prickly, growing to length of 1.5 m (5 ft).

The leaves are bipinnately compound, with one or two pinnae pairs, and 10–26 leaflets per pinna. The petioles are also prickly. Pedunculate (stalked) pale pink or purple flower heads ascend from the leaf axils in mid-summer with more and more flowers as the plant gets older. The globose to ovoid heads are 8–10 mm (0.3–0.4 in) in diameter (excluding the stamens). On close examination, it is seen that the floret petals are red in their upper part and the filaments are pink to lavender. Pollens are circular with approximately 8 microns in diameter.

The fruit consists of clusters of two to eight pods from 1–2 cm (0.4–0.8 in) long each, these being

prickly on the margins. The pods break into two to five segments and contain pale brown seeds about 2.5 mm (0.1 in) long. The flowers are insect-pollinated and wind-pollinated. The seeds have hard seed coats which restrict germination and make osmotic pressure and soil acidity less significant hindrances. High temperatures are the main stimuli that cause the seeds to end dormancy.

This plant of roots avoids pathogenic and mycorrhizal fungi from growing within the plant's rhizosphere. This allows the formation of nodules on the roots of the plant that contain endosymbiotic diazotrophs, which fix atmospheric nitrogen and alter it into a form that is usable by the plant.

Common Name:Black mimosa Scientific name: Albizia julibrissin. Nativity: Tropical North America Distribution in India: Himalaya, Western Ghats Features: Aggressive colonizer. It invades water courses and seasonally flooded wetlands.

#### Black mimosa in India:

**Description:** The Mimosa Tree is known by many other names throughout the world. Its Italian namesake, Filippo degl Albizzi, provides it a portion of its scientific name, *Albizia julibrissin*. The other part of the name is derived from a

Persian word meaning "silk flower". Commonly found throughout the world's warmer climates, the Mimosa Tree is a popular <u>ornamental flowering tree</u>. It is also fast-growing, assembly it an irresistible choice for many homeowners. For gardeners hoping to afford dappled shade for



smaller plants, the 20 to 25 foot itall Mimosa Tree provide the necessary height, shape, and leave



density. It is always a beautiful addition to the garden. These drought-resistant and fast-growing trees do produce beautiful flowers, which when coupled with its small fruit and leaves, can create the need for a clean-up routine. Well worth the clean-up and pruning, Mimosa Trees are positively beautiful when planted as either a central focal point in the yard or in a row as a border along entryways or fences. Appreciate the luscious pink blossoms in

summer and

the gentle shape throughout the year. Mimosa Trees prefer the moist, well-drained soil typical of loam. With regard to pH, the tree enjoys slightly acidic soil. Despite these preferences, the Mimosa Tree readily adapts to various soil conditions. Water is not as much of a concern for the Mimosa Tree. In fact, short dry spells will not harm this tree since it is drought-resistant. Like most flowering trees, the Mimosa prefers at least an



inch of water a week in the form of rainfall or irrigative services. If the region in which the tree is planted is inclined to to severe droughts, consider investing in an irrigation system that will not only help control the flow of water, but disperse it to the Mimosa during those truly hot, longlasting droughts. The Mimosa Tree is a beautiful ornamental plant. When considering planting locations, look for one where its beauty will shimmer!

#### Conclusion

Invasive species are a very negative affect on the biodiversity of our ecosystems and need to be exterminated. Invasive species have contributed to the decline of 42% of U.S. endangered and threatened species, and for 18% of U.S. endangered or threatened species, invasives are the main cause of their decline. Invasive species compete directly with native species for moisture, sunlight, nutrients, and space. Overall plant diversity can be decreased. Establishment and spread of invasive species can degrade wildlife habitat. Invasive alien species are plants, animals, pathogens and other organisms that are non-native to an ecosystem, and which may cause economic or environmental harm or adversely affect human health. In particular, they impact unpleasantly upon biodiversity, counting decline or elimination of native species – through competition, predation, or transmission of pathogens – and the disruption of local ecosystems and ecosystem functions.

# **ECOSYSTEM** RESTORATION

#### Gunna Lahiri

**KGVB Mandasa** 

#### Winner of essay competition held on world wildlife day, 2021

#### NATURE HELP US FIND PEACE AND GROWTH

**RESTORE ECOSYSTEM TO SAVE OUR** PLANET

#### **INTRODUCTION**

Our environment is one of the most important components to survive on this planet. We cannot survive a single day without it. It is the only thing that can make life sustainable. Thus it is important that we take care of our ecosystem. Also abandon all the exploitation that we are causing.

#### **MEANING OF ECOSYSTEM RESTORATION:**

Ecosystem Restoration refers to the assisting in the recovery of ecosystem that has been degraded & destroyed; as well as conserving the ecosystem that are still intact. assisting have been Healthier Ecosystems, with richer biodivimsity, yield greater benefits such as more fertile soils, higher yields and larger stores of greenhouse gases.

Restoration can happen in many ways. For example through actively planting or by removing pressures so that nature can recover on its own ways.



S. THIYAKSHWA, 6th sta

Poster by: S Thiyakshwa (joint 3rd Winner, Junior Group), WED poster competition

**"Stopping Pollution is the best solution." Importance of Ecosystem Restoration:** 

Ecosystem restoration becomes a fundamental element of ecosystem management. It can be a primary component of conservation and sustainable development Programmes throughout the world. What makes ecosystem restoration uniquely valuable is its inherent capacity to provide people with the opportunity not only to repair ecological damage, but also improve the human condition. The conservation benefit of India are obvious.

#### **USES OF ECOSYSTEM RESTORATION:**

Ten Steps in a successful Ecological Restoration and Site Planning

- Inventory and map the Ecological resources and describe their Current Condition
- Describe the site's history, and map it where possible. Use old aerial photographs, original Land Survey records and maps produced from them, historical descriptions, oral histories, logging records, 1930's economical land survey, Johnson fire maps etc.
- Develop a hypothesis of how the siginal system worked. Review technical literature for related Ecological studies nearby conducted in the region; visit nearby natural areas
- Develop goals for each management units by assiting the potential of that unit for restoration with reasonable effort, and specifying its desired future condition.
- Develop an implementation plan to accomplish the goals. Identify and schedule tasks, specify methods, estimate material costs and labor for each management unit.
- Design and moniroring program to evalute the success of the restoration.
- Implement the restoration program. Develop Proposal, obtain funding, establish administrative field capacities to carry out tasks, install a monitoring program and then begin restoration work.
- Prepare reports and papers that explain the project and describe results.
- Periodically evaluate the program by incorporating new information into the plan, revising goals, and modifying the rescheduling tasks.
- Communicate and Educate interested and potentially affected parties to provide basic information and comfort with the restoration Process.

In all cases Ecological resisation will improve the biological diversity on degraded land Scapes, increase the populations and distribution of rare and threatened species, enhance landscape connectivity, increase the availability of environmental goods and services and contribute to the improvement of human well-being. Ecosystem restoration could also remove 13-26 gigatonnes of greenhouse from the atmosphere.

#### HOW RESTORATION CAN HAPPEN?

Restoration can happen in many ways. For example through actively planting or by removing pressures so that nature can recover on its own. It is not always possible or desirable to return

an ecosystem to its original state. For example we still need farmland and infrastructure or land that was once forest any ecosystems like societies need to adapt to changing climate.

#### WHICH KIND OF ECOSYSTEMS CAN BE RESTORED?

All kinds of ecosystems can be restored including forests, cities, wetlands and oceans. Restoration initiatives can be launched by almost anyone from governments and development agencies to businesses, communities and individials. That is because the causes of degradation are many and varied, and can have an impact at diffement scales.

#### **ECOSYSTEM RESTORATION IN INDIA:**

Ecosystem restoration is still a developing discipline in India, with a limited number of practitioners and projects. Most initiatives are small site specific, on the other hand the need for restoration is possible considerable and urgent example most forest using degraded due to intense human pressure. Mat initiatives, one Small and site specific on the other hand, the need forestation is considerable and agent Fr Frample. using outside Protected areas have been degraded due to high human pressure.

#### **CONCLUSION:**

It is concluded that ecosystem restoration can help us achieve all of the Sustainable Development Goals. Restoring all large and small ecosystems protection improves the livelihood of people who depend on them. It also helps to reduce the risk of disease and natural disaster.

Ecosystem restoration.....is the best Solution...There is a need for agriculture and infrastructure on land that was once a forest. Societies need to adapt to the changing ecosytem. With such understanding and contribution there will be no harm to any animal, plant and human life. People, animals and plants depend healthy. Everyday life and luxury would not be possible without their services and resources (SER). In a sand country Almanac, author and ecologist Aldo Leopold states "we abuse the land as a community to which we belong, we may begin to use it with love and respect". Restoration gives us an opportunity to improve our relationship and allows us to become a constructive part of the communities that creates our natural environment

### Some facts and figures of invasive insect species in India

Dr. Sampriti Kataki Program Officer

#### Invasive species:

Species that has established and spread or has the potential to do so outside of its natural distribution range, and which then threatens ecosystems, habitats and/or other species, potentially causing economic and/or environmental damage, or harm to human health is called (Invasive species specialist group (ISSG) module, IUCN, 2012).

#### Legal controls for the movement of invasive species:

It is done by International Plant Protection Convention (IPPC), 1951 of FAO, United Nations and its Regional Plant protection organizations (RPPOs). IPPC provides international framework for plant protection which includes, development of International Standards for Phytosanitary Measures (ISPMs) for safeguarding plant resources, information exchange on pest status and regulated pest in each country and Sanitary and Phytosanitary (SPS) Agreement under WTO. In India, Invasive insects/Invasive Alien Insects, are being monitored by Directorate of Plant Protection, Quarantine and Storage (DPPQ&S), ICAR-NBPGR, ICAR-NBAIR and other crop-specific institutes of ICAR, Ministry of Agriculture and farmer's welfare, Government of India. DPPQ&S adopted various laws *viz.*, The Destructive Insects and Pests Act, 1914 and amendments, The Plant Quarantine (Regulation of Import into India) Order 2003 – Amendments, and adopting international guidelines from International Plant Protection Convention (IPPC, 1951), WTO-SPS Agreement, and International Standards on Phytosanitary Measures (ISPMs) to avoid/stop any entry of invasive insects/pathogens/weeds to the country via international Trade and commerce. For the export of Agricultural commodities, Phytosanitary Certificates (PSC) is being issued in accordance with the IPPC convention.

#### Invasive insect in India

Total of 32 insect pests have been reported as invasive insects in India, (20 from the order Hemiptera, 4 species belong to Lepidoptera, 3 are from Coleoptera, 2 each from Diptera, and Hymenoptera and one Thysanoptera).

- First occurrence of invasive species in India : San Jose scale (*Comstockaspis perniciosa*) (Comstock) in 1879 from China
  - Pathways of invasion Introduced as contaminants Living industry pathway Transportation related
  - Control method
    Mechanical
    Chemical
    Biological

**Characteristics of an invasive species** Very resilient Short life cycle Broad host range High dispersal ability Ability to withstand many environmental conditions High fecundity Voracious feeders Benefits from mutualist interaction

•	Management strategies of invasive insect
	Extensive knowledge base about morphology, ecology, genetic make-up, place of origin
	Tracking detailed geographical distribution,
	Identifying, augmenting natural enemies
	Identifying control agents
	Developing resistant cultivar
	Judicious use of insecticide to prevent insect resistance and resurgence
	Modification of crop management practices
	Developing integrated pest management program
	Phytosanitary regulations to prevent introduction of pests
	Region oriented efforts
	Preparation of Pest Risk Analyses (PRA) helpful to identify the quarantine pest in advance, so that
	mitigation measures can be prepared.
	Comprehensive mapping of possible entry of invasive insects
	Early detection

#### Main insect pests in India

Nome of the energies	Uest	Ovigin	Egiontific nomo
Name of the species.	HUSL		
Wooley apple aphid	Apple	Eastern North Ameria	Eriosoma lanigerum
San Jose Scale	Mostly rosaceous fruit	China China	Comstockaspis perniciosa
	trees		
Lantana bug /	polyphagous, usually	Srilanka	Insignorthezia insignis
Greenhouse orthezia	preferring woody		
	hosts, occurring mainly		
	on the shoots and twigs		
Diamondback moth	Brassicaceae	North America	Plutella xvlostella
	21000100000		Linnaeus
Potato tuber moth	Tobacco tomato brinial	Italy	Phthorimaga opercullela
i otato taber moti	heet and it is a	itury	i nenor iniaca oper caneta
	sorious post of stored		
	potato		
			· · · · · · · · · · · · · · · · · · ·
Cottony cushion scale	numerous plant families	Australia	Icerya purchasi
	mainly citrus		
Pine woolly aphid	Pineus spp.,	Western and central	Pineus pini
		Europe	
Subabul psyllid	Leucaena spp.	Central America	Heteropsylla cubana
Fall armyworm	Maize, millet, sorghum,	America to Africa, Africa	Spodoptera frugiperda
	sugarcane, rice, wheat,		
	cowpea, groundnut,		
	potato,soybean, cotton		
Diamondback moth	Cabbage, cauliflower:	1211111111111111111111111	Plutella xvlostella
	radish. Knol-khol, turnin		
	beetroot mustard		
	been oot, mustaru		

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Webinar on "Environmental sustainability: the journey from the 'blue marble' to sustainable development goals"

To celebrate the World Environment Day, 2022 the center organized one webinar on 6th June, 2022. On this very important day for environment enthusiasts, Dr. Moonmoon Hiloidhari from Nalanda University was invited as the Guest speaker to deliver a talk and share his experiences in this regard.

Dr. Moonmoon Hiloidhari is a Teaching Fellow in the School of Ecology and Environment Studies at Nālandā University. He has been the recipient of prestigious Fulbright-Nehru Fellow and worked at the University of California, Davis, USA.





Dr. Hiloidhari also worked as a Senior LCA Analyst with Green Story (Toronto, Canada), as a Senior Project Scientist at IIT Delhi. asan Institutional Postdoctoral Fellow 1IT.

Bombay, as a Dr. D S Kothari Postdoctoral Fellow at Jawaharlal Nehru University, India.



He spoke on the topic: Environmental sustainability: the journey from Blue marble to Sustainable Development Goals (SDG). Climate change, energy crisis and other sustainability issues are at the forefront of today's global political dialogue. The well-being of ecosystem goods and services entirely depends upon our lifestyle. It is our constant

endeavour to understand the Earth system better so that solutions to the current environmental crises could be arrived at. In this connection, there have been significant events and milestones in the last 50 years to achieve environmental sustainability. His talk highlighted some of such events with a particular emphasis on circular lifestyle.

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The webinar began with a welcome address from Dr. Sampriti Kataki, Program Officer at ENVIS. Dr. Maya Mahajan, ENVIS Coordinator and Associate Professor at Amrita Vishwa

Vidyapeetham briefly highlighted the activities of the ENVIS center. The guest talk was followed by a live interactive Q and A session. Nearly 30 participants from across the country and various disciplines participated in the webinar.



Celebration of World Environment Day, 2022

ENVIS, Amrita along with Amrita University celebrated World Environment Day and carried out various day long activities in the University campus. As a part of the celebration, extensive plantation programme with native evergreen and



semievergreen species was carried out. On this occasion, "Amrita Vanam" a mini model of rain forest was inaugurated. DFO Ashok Kumar inaugurated the function by planting sapling in Amrita Vanam and also distributed prices for slogan and poster making competition organized

by Amrita Nature Club. On World Environment Day an initiative "Amrita Green hackathon" was also launched. Several projects based on "Indian knowledge system", "waste management/water conservation" and "green campus/smart campus" were initiated. Around 500 students Amrita from University participated in the program.



#### Amrita Vanam" a mini model of rain forest



### -27 Problems to find Solutions

#### Waste Management / Water conservation

- \*Dash board to sense electricity consumption at Hos \*Dash board to know water consumption of Hostels
- Dash board to sense Water storage at Coimbatore campus
  Dash board to sense waste collection at various dustbins in the campus
- \*Motion sensing circuit for street lights
- Sensor deployment for animal movements on fencing of the campus
- \*Technology to purify rain water harvested in the campus \*Technology to purify the Sewage water collected in the campus

#### **Green Campus-Smart Campus**

- Mobile app to compute carbon foot print of a campus resident Mobile- low cost technology for soil testing Technology to optimize the irrigation of vegetation in the campus
- + Digitization of the data base of trees in the campus
- Digital repository of plants, birds, butterflies in the campus
- Digital field guide to identify birds and butterflies in the camp campus
- Digital field guide to identify trees in the campus
- Calculator for nutritive value of food served in campus, mess, canteen, or their home
- Calculator to calculate carbon footprint of individual student or department
- Developing technologies to make innovative bio-pesticides and bio fertilizers using kitchen waste and plant waste
- Digital app for Bird identification using their calls (recording sounds)
- Developing plans to convert existing buildings in the campus into green buildings

amlaoya

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#### Indian Knowledge System

- •Website on tradition me ines and her Monitoring of paper usage in each depa Website on unsung leaders in Enviror in India
- · Website on nutritional and traditional Website on impacts of pesticides and for Chemical agriculture on health and environments
- Chemical agriculture on health and emi-& Developing technologies to produce ec free toiletry kits including soap, shamp hair colour, lip balm, hair conditioner' using neem, shikakai, soap nut, heena green gram, coconut oil etc etc. and m







"By Living in harmony with Nature one gains a healthy Mind and Body" - AMMA

HACKATHON' 22 COIMBATORE CAMPUS Indian Knowledge System Website on tradition medicines and herbs Monitoring of paper usage in each department Website on unsung leaders in Environmental move in India

AMRITA

GREEN

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- +Website on nutritional and traditional food in India Website on impacts of pesticides and food grown by Chemical agriculture on health and environment
- Chemical agriculture on nealth and environment & Developing technologies to produce ecofriendly, chemical free toiletry kits including soap, shampoo, tooth powder, hair colour, lip balm, hair conditioner and other products using neem, shikakai, soap nut, heena, hibiscus, turmeric green gram, coconut oil etc etc. and marketing plan





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### 15 Best concepts will be selected to



Best prototypes receive prizes



#### on on website https://intranet.cb.amrita.edu/events/2022/amrita-g

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### EVENTS ON WED, 20200



ENVIS Amrita Vishwa Vidyapeetham celebrated World Environment Day, 2022 by organizing Two compititions: *a poster contest* and *slogan writing* competition to raise awareness among students and research community. The theme of poster contest was "Heal the earth for sustainable future"". The slogan writing competition was held on the theme "Only one earth: living in harmony with Nature". Further, a separate category of the same events was also organized only for Amrita University, Coimbatore students on the same themes.

Both the contest received overwhelming response from environment enthusiasts of differen age group. For the poster compitition more than 100 entries were received, while for the slogan compititions more than 40 entries were received. The winners were evaluated by external evaluator experienced in relevent field. The winning entries would be included in the next issue of the center newsletter 'Bioinvasion' and would also be given e certificates.



ENVIS, Amrita & Amrita Nature Club World Environment Day Celebration

COMPETITION Entry deadline 1st June, 2022 Call for entries!! Theme "Heal the earth for sustainable future" I Open to all I jpeg/png /tiff format I Send your entries to bioinvasion.envis WORLD ENVIRONMENT @gmail.com DAY along with your details (Name, Affiliation)

# Winning posters



Poster by: RAmitha Shree, 2<sup>-d</sup> winner (Jointly, Senior group)



Poster by: Khushi Vmesh Shringi, 3" winner (Jointly, Senior group)



Poster by: Vikash Pariyar, Consolation, (Senior group)



Poster by: Nilanjana Deb, Consolation (Senior group)



Poster by: Benson Hika Mwangi , Consolation, (Senior group)





Poster by: Chandrima Ghosh, (3" wiiner, jointly, Junior group)



Poster by: Niku Bhuyan, (Consolation Junior group)



Poster by: Shreya Prashant Raikar (Consolation, Junior group)



Poster by: Satyam Yadav (Consolation Junior group)





Poster by: Sanchi Bansal, (Consolation Junior group) Poster by: Joshua M, (Consolation Junior group)



Poster by: Pranamya R. (Consolation Junior group)



Poster by: R Jay Harni, (Consolation Junior group)



Poster by: B. Divyadharshini, (1\* winner, Kids group)



Poster by: M.Iniya Karthick, (2<sup>d</sup> winner, kids group)



Poster by: Debosmita Banik, (3" winner, kids group)



# Winning Slogans Junior group

" Preserve Species , Protect Nature . Join Hands For A Secure Future " - Ahaana Paikray, St Joseph High School, Bhubaneswar ,Odisha "Nature talks to those who can listen to it, narrates to those who can feel it and and teaches those who can learn from it" Soumyosree Chatterjee (Joint 1<sup>st</sup> winner)

"On This Evil Earth, Choose Your Friends Wisely. I Tell You, Nature Is The Wisest Of Them All." - Megha Malhotra, St Thomas' Girls Sr Sec School, New Delhi No nature no future, plant a tree and get oxygen for free; protect the scenery and preserve the greenery; save the trees save the earth, we are the guardians of nature birth; Our environment is in your hands, lend a hand to save the land" K A Jayashree, B.M.D Jain school, Vellore (Joint 2<sup>nd</sup> winner)

> "If We Learn To Live In Harmony With Nature, We Will Learn To Understand Each Other And Live In Peace" - Kapilraj.V (3<sup>rd</sup> Winner)

Nature is the most comfortable mattress, don't give bed bugs of pollution any space Avishikta Kundoo (Consolation)

# Winning Slogans Senior group

"Sustainability Is The Solution, To The Problem Of Pollution! " -Santhanagopalan.S, Sastra Deemed To Be University, Thanjavur "प्राणवायु के दाता हैं हम, हम ही से है, ये धरा और गगन जीव जंतु मनुष्य सब संग, मिलकर बनाते प्रकृति के अभिन्न अंग " Pooja Bansal, Jaipur (Joint 1<sup>st</sup> winner)

#### "पृथ्वी से जोड़ो नाता प्रकृति हमारी भाग्य विधाता।"

- East Champaran, Bihar "Come Together, Better late than Never Let's preserve the weather Endeavour - One Earth , One treasure!" Dr Ashwini Raju S, Karnataka Institute of Medical Sciences Hubballi (Joint 2<sup>nd</sup> winner)

"Sang Ho Jab Kudrat Ke Sab Rang, Toh Manab Jivan Me Ho Umang" -Dr. Radhika Thakur, Assistant Professor Sri Sai University Palampur "If preservation is better than cure then harmonizing with nature can revive earth for sure" Nidhi Yadav, MA 1st year, IGNOU (Joint 3<sup>rd</sup> winner)

"Our home is in danger, let's take a vow, Save mother Earth, She needs us now" Abhijeet Chatterjee, Freelance Professional, Certified Financial Planner Consolation

### WED talk by ENVIS coordinator, Dr. Maya Mahajan





Associate Professor Center for Sustainable Future Amrita Vishwa Vidyapeetham, Coimbatore

**Title:** Empowerment of tribal women in India for Sustainable livelihood and Forest conservation

vww.amrita.edu

/sbcs SIGN UP NOW

Dr. Maya Mahajan, ENVIS coordinator distinguished talk on 2.6.2022 on the topic Empowerment of tribal women in India for sustainable

livelihood and forest conservation organized by Amrita International center. She delivered a talk on "Empowerment of tribal women in India for sustainable livelihood and forest conservation" Your feedback on this issue, as well as short articles on biological invasion/invasive alien species and poems, artwork, paintings related to biodiversity conservation, waste management, climate change etc. for our upcoming newsletter issues are most welcome. You can send your entries with your contact details to our:

Request for Articles and Feedback

email: envis.bioinvasion@gmail.com



Poster by: Monika (1" Winner (jointly) of poster competition (Junior group), World Environment Day, 2022)



Poster by: Sajal Jain (1" Winner (jointly) of poster competition (Junior group), World Environment Day, 2022)